

13.

Pentatrichomonas macropi Tanabe from Kangaroos.

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(Text-figure 1).

A Woodward's wallaroo, *Macropus robustus woodwardi*, in the collection of the New York Zoological Park, died on July 5, 1938. It was autopsied at the Hospital and Laboratory of the Zoological Park within an hour after death. A microscopical examination of material obtained from the enlarged and distended caecum revealed a flagellated protozoan organism of the *Trichomonas* type. Subsequently this parasite was obtained from the caecal contents or feces from a total of five species of kangaroos living at the New York Zoological Park.

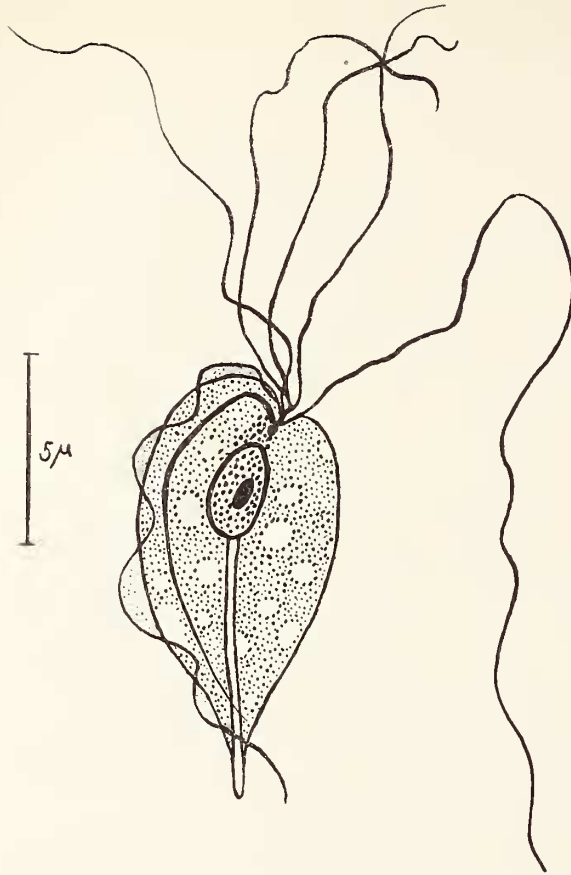
The original material collected from the caecum of the wallaroo was taken to the laboratory of the Mt. Sinai Hospital by Dr. L. Finkelstein and successfully grown on blood agar slants. It was maintained further, by transfers on this media, at the Laboratory of the Zoological Park.

Observations were made from living specimens—both fresh and cultured material—and from fixed preparations. The fixatives employed in this study were Schaudinn's fluid (plus 5% glacial acetic acid), osmic acid vapor and methyl alcohol. Organisms killed with either of the first two fixatives were stained with Heidenhain's iron-alum haematoxylin. Organisms fixed in methyl alcohol were stained with Giemsa's stain. The Giemsa method was found to be best for diagnostic purposes. The stain was used in the same concentration and for the same length of time as employed for blood smears.

The morphology of this parasite agrees with the description of *Pentatrichomonas macropi* Tanabe (1926). Tanabe's description of this parasite from a kangaroo (genus and species not given) was made entirely from cultured material. In the present study there seemed to be a much greater diversity in size in the fresh material and a greater variation of shapes in the cultured forms. The length of specimens from fresh material varied between 4.5 μ and 15 μ while in the cultured forms the size tended toward an average between 7 and 10 μ as reported by Tanabe. A diagrammatic sketch of *Pentatrichomonas macropi* made from observations on both fresh and cultured forms is included in this paper as a text-figure.

The following hosts in the collection of the New York Zoological Park have been found to be infected with this parasite:

- 3 rock kangaroos, *Macropus brunii*.
- 2 Woodward's wallaroos, *Macropus robustus woodwardi*.
- 3 black-faced kangaroos, *Macropus melanops*.
- 3 great gray kangaroos, *Macropus g. giganteus*.
- 3 black tree kangaroos, *Dendrolagus ursinus*.



Text-figure 1.

Pentatrichomonas macropi Tanabe. From kangaroos (diagrammatic sketch).

Pentatrichomonas macropi grows quite readily on a variety of culture media at 37° C. The greatest abundance of organisms can be found in original cultures between 48 and 72 hours after inoculation with fecal material. Subcultures were successfully made through seven transfers. The parasites tend to die out after 72 hours (becoming overwhelmed with bacteria) and even in subcultures the organisms never achieved the great numbers seen in the first tubes inoculated.

A number of culture media were tested as to their ability to support a growth of *Pentatrichomonas macropi*. Fair growth was obtained with the following: undiluted blood serum, diluted blood serum (1 part serum plus 1 part dist. aqua), Loeffler's serum-saline (0.5% Loeffler's plus 0.75% serum), and Hogue's ovo-mucoid (100 cc. physiological saline plus white of one egg). Good results were obtained with blood agar slants. The water of condensation did not prove sufficient to support a growth of the trichomonads but good results were obtained when the various liquid media listed above were added in small quantities. Distilled water or saline on blood agar slants also supported a good growth. Charcoal agar with these various fluids did not support as abundant a growth as the blood agar media. Horse blood was used throughout in the preparation of the culture tubes. The organisms seem to

require a liquid medium but prefer a solid base such as a blood agar slant. The best medium obtained in these experiments was a fecal infusion on blood agar slants. Both rat feces and kangaroo feces were tried with equal success and were used for routine diagnosis of *Trichomonas* in most of the kangaroos studied antemortem.

Of five of the kangaroos that came to autopsy during this study, three had ulcers in the digestive tract. A careful examination of microscopic sections of these ulcers in each case did not reveal any trichomonads associated with the necrosis. Whether or not there is any correlation with the presence of *Pentatrichomonas macropi* and the occurrence of ulcers in kangaroos it would be impossible to state from our present knowledge. Only one of these animals exhibited a diarrhea.

Samples of intestinal contents from various areas seem to indicate that *Pentatrichomonas macropi* is primarily a parasite of the caecum. However, positive evidence of their presence in other portions of the large intestine and the posterior region of the small intestine was obtained both by direct smear and by the culture method.

SUMMARY.

1. A trichomonad parasite, *Pentatrichomonas macropi* Tanabe, is reported from five species of kangaroos in the collection of the New York Zoological Park.

2. The parasites can be grown readily in vitro. The best culture media found was fecal infusion on a blood agar slant at 37° C.

3. Although three of the kangaroos infected with trichomonads were found to have intestinal ulcers, no parasites could be found in the tissues and it is doubtful if there is any correlative significance to this finding.

BIBLIOGRAPHY.

TANABE, M.

1926. Morphological studies on *Trichomonas*. *Jour. Parasit.* 12, 120-130.